

## **【CLAIMS】**

### **【Claim 1】**

A boring system comprising:

a bit unit for boring a ground,

5 a connecting rod connected with a driving device for transmitting driving force to the bit unit, and

a guide unit connected with the connecting rod in a longitudinal direction, the guide unit guiding movement of the bit unit along a guide groove which is formed in a casing inserted into an adjacent boring hole in the longitudinal direction.

### 10 **【Claim 2】**

The boring system of claim 1, wherein the guide unit is a guide rod connected with the connecting rod in one side, and inserted into the guide groove.

### **【Claim 3】**

15 The boring system of claim 2, wherein a friction reduction unit for reducing friction resistance with the guide groove is further installed in outer side of the guide rod.

### **【Claim 4】**

The boring system of claim 2, wherein the friction reduction unit comprises a plurality of rollers installed in the outer side of the guide rod.

### 20 **【Claim 5】**

The boring system of claim 2, wherein the guide unit is comprised of in plural, and the plurality of the guide units are installed in order in a longitudinal direction of the connecting rod.

### **【Claim 6】**

25 The boring system of claim 2, wherein the cross section of the guide rod corresponds to the cross section of the guide groove.

### **【Claim 7】**

The boring system of claim 2, wherein the width of the cross section of the guide rod decreases toward a portion thereof connected with the connecting rod.

### 30 **【Claim 8】**

The boring system of claim 2, wherein the cross section of the guide unit has a 'U' shape of which opening portion of the guide unit is connected with a roller.

**【Claim 9】**

5 The boring system of claim 8, wherein the guide unit is connected with the connecting rod by screw or welding.

**【Claim 10】**

The boring system of claim 8, wherein an opening portion of the guide unit is wider than a connecting portion connected with the connecting rod.

**【Claim 11】**

10 The boring system of claim 1 or 2, wherein the bit unit is one of an air hammer and a blade-type bit.

**【Claim 12】**

The boring system of claim 1 or 2, wherein an outer surface of the connecting rod is formed with a screw.

15 **【Claim 13】**

The boring system of claim 1 or 12, wherein the guide unit further comprises a rotation prevention unit for preventing the guide unit from rotating due to rotation of the connecting rod.

**【Claim 14】**

20 The boring system of claim 13, wherein the rotation protection unit is a bearing.

**【Claim 15】**

The boring system of claim 14, wherein the bearing is connected to an outer surface of the connecting rod and an outer surface of the bearing is connected with the guide unit.

25 **【Claim 16】**

The boring system of claim 1 or 2, further comprising:

an auxiliary casing inserted into the adjacent boring hole and formed with a guide groove along the auxiliary casing in a longitudinal direction for being inserted with the guide unit and guiding the guide unit.

30 **【Claim 17】**

The boring system of claim 1 or 2, wherein the guide unit is extended from an end of the bit unit.

**【Claim 18】**

A boring system comprising:

5 a bit unit for boring the ground,  
a connecting rod connected with a driving device for transmitting driving force to the bit unit,

a main casing inserted with the connecting rod, and

10 a guide unit connected with the outside of the main casing in a longitudinal direction, the guide unit guiding movement of the bit unit along a guide groove which is formed in a casing inserted into an adjacent boring hole in a longitudinal direction.

**【Claim 19】**

The boring system of claim 18, wherein the guide unit is a guide rod connected with the main casing in one side and inserted into the guide groove.

15 **【Claim 20】**

The boring system of claim 19, wherein a friction reduction unit for reducing friction resistance with the guide groove is further installed in outer side of the guide rod.

**【Claim 21】**

20 The boring system of claim 20, wherein the friction reduction unit comprises a plurality of rollers installed in the outer side of the guide rod.

**【Claim 22】**

25 The boring system of claim 19, wherein the guide unit is comprised of a plurality of the guide units installed in order in a longitudinal direction of the main casing.

**【Claim 23】**

The boring system of claim 19, wherein the cross section of the guide rod corresponds to the cross section of the guide groove.

**【Claim 24】**

The boring system of claim 19, wherein the width of the cross section of the guide rod decreases toward a portion thereof connected with the main casing.

**【Claim 25】**

5 The boring system of claim 19, wherein the cross section of the guide unit has a 'U' shape of which opening portion of the guide unit is connected with a roller.

**【Claim 26】**

The boring system of claim 25, wherein the guide unit is connected with the main casing by a screw.

**【Claim 27】**

10 The boring system of claim 25, wherein an opening portion of the guide unit is wider than a connecting portion connected with the main casing.

**【Claim 28】**

The boring system of claim 19, wherein the bit unit is one of an air hammer and a blade-type bit.

15 **【Claim 29】**

The boring system of claim 18 or 19, wherein an outer surface of the connecting rod is formed with a screw.

**【Claim 30】**

20 The boring system of claim 18 or 19, wherein the guide unit further comprises a rotation prevention unit for preventing the guide unit from rotating due to rotation of the connecting rod.

**【Claim 31】**

The boring system of claim 30, wherein the rotation protection unit is a bearing.

**【Claim 32】**

25 The boring system of claim 31, wherein the bearing is connected to an outer surface of the main casing, and an outer surface of the bearing is connected with the guide unit.

**【Claim 33】**

The boring system of claim 18 or 19, further comprising:

an auxiliary casing inserted into the adjacent boring hole and formed with a guide groove along the auxiliary casing in a longitudinal direction for being inserted with the guide unit and guiding the guide unit.

**【Claim 34】**

5           The boring system of claim 18 or 19, wherein the guide unit is extended from an end of the bit unit.

**【Claim 35】**

A boring method comprising:

first boring step for boring first boring hole in the ground,

10           casing inserting step for inserting a casing formed with a guide groove in a longitudinal direction, and

second boring step for boring second boring hole with a bit unit moving along the guide groove of the casing in a longitudinal direction.